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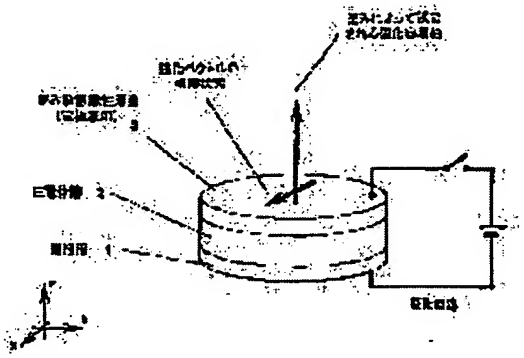
(54) MAGNETIZATION DRIVING METHOD, MAGNETIC FUNCTIONAL ELEMENT AND MAGNETIC DEVICE

(57)Abstract:
PROBLEM TO BE SOLVED: To perform a swing-by switching operation at high speed by a method wherein the direction of the magnetization vector of a magnetic body is changed and a driving force is applied, in a pulse manner, to a direction nearly perpendicular to the magnetization vector of the magnetic body in a starting state before the driving force is applied.
SOLUTION: A drive circuit is connected across an electrode layer 1 and a strain- sensitive magnetic thin film 3 which is used also as an electrode layer. When a voltage is applied in a pulse, a piezoelectric layer 2 is contracted to, e.g. the direction of the electric field. When a piezoelectric crystal has a rotational symmetry of higher than three-fold around the z-axis, an isotropic extension strain is generated in the in-plane direction of the piezoelectric layer 2 due to its contraction. Then, an in-plane isotropic tensile strain is given to the strain-sensitive magnetic thin film 3. When the magnetization of the strain-sensitive magnetic thin film 3 has a large negative value, stress-induced magnetic anisotropy in which the perpendicular direction becomes an easy axis of magnetization is generated in the face of the film under this situation. Then, the perpendicular magnetic anisotropy becomes the driving force of a swing-by switching operation.



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